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THE ADVANTAGE OF PRELIMINARY EXAMINATION TO PHARMACY, AND TO THIS COLLEGE.

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Read at the Pharmaceutical Meeting, January 20, 1885.

If it should be thought that this paper is not entirely appropriate to the object of this meeting, its acceptance is asked for on the ground that it is in part a reply to a paper read at the December meeting, "On the Recent Advances in the Methods of Instruction in the Philadelphia College of Pharmacy," which paper and some subsequent remarks by its author are likely to lead to erroneous impression as to exactly what is meant, and what is contemplated by Preliminary Examination.

The present system, recently adopted by the College, of progressive or trial examinations of the junior students, was accepted by the Trustees as a step towards an ultimate view, upon careful consideration, and in deference to the openly expressed sentiment that some better means of discrimination in the materiel of the classes should be made. This tentative plan has not been favored, however, by those who advocate preliminary examination in its proper sense and relation, because it in no wise reaches the principle involved—it fails to afford the result desired, or to radically change the defect of method, and is, moreover, an act of injustice to the student.

The necessity of such a system as is now urged upon this College is based upon a wise precedent—upon the future welfare of pharmacy, upon the future status of the graduate, and upon the mutual relations of this institution to the profession at large—and further by reason of the fact that, so far as we are made aware, there is no inquiry instituted here on the entrance of a matriculant, or candidate, to determine his fitness, not only in reference to his rudimentary knowledge of pharmacy, nor as to his as much needed educational requirements in the common branches of learning. To read intelligently, to write legibly, to be creditably proficient in simple mathematics, and to

understand the primary construction of the Latin language, are clearly and plainly essential qualifications, and any young man not thus equipped enters this institution and pharmacy at great personal disadvantage; it is simply the dictate of candor and truthfulness to tell him so, and advise further preparation. It is to determine the possession of these qualifications that preliminary examination will be instituted—*before* the student is admitted to collegiate courses—to require this *after* his entrance, presuming that he is deficient, is to embarrass his progress, dispirit and discourage him, and to involve him in a mental effort for which he is wholly unprepared. With all the unfavorable conditions apparent, he is yet received here, and entered upon a theoretical and technical course. With an ambition worthy, perhaps, of more consideration, without reference to his inability to retain and comprehend he has to keep pace with his better favored associates in the end only to be relegated back, rejected, mortified, and disgraced. How much more just and generous to intercept his entrance, point out his palpable deficiencies, and advise a better course of preliminary preparation! Without further remark on this, it will be evident, we think, to any one that reflects that “no consideration as to confronting the candidate with an apparent difficulty should be allowed to weigh against imposing a set of conditions framed with the sole object of bringing him to the examination room more thoroughly equipped for the ordeal itself, and for the creditable fulfillment of the duties of his life work.”

In September of the year 1870, a Pharmaceutical Educational Conference was held in Baltimore, at which all the then existing colleges were represented. A resolution was offered by Mr. A. B. Taylor, of this purport: “That there be an educational standard established, the evidence of which shall be given *previous* to the admission of any student to attendance on the lectures of the Colleges of Pharmacy;” with a modification which did not change the spirit of the resolution, this was adopted.¹ We quote simply to show the existing state of opinion at that time on this subject.

¹ Whether the spirit was changed or not is best learned from the resolution which, as offered by Prof. Procter and adopted, is as follows (italics our own):

Resolved, That in the opinion of this Convention, more attention to the preliminary education of those who propose to enter the business of pharmacutists is needed, and it is earnestly recommended to the Colleges and Societies of Pharmacy to urge their members and the profession of the United States generally to give greater care to this subject in taking apprentices.

The complaint expressed in this resolution was not of recent date; for at the Con-

President J. Faris Moore, of the American Pharmaceutical Association, at the session held in Cincinnati, September, 1864, in his annual address, holds the following language: "We often find young men, thoroughly apt in their manipulations, and possessing more than ordinary talent in other respects, most woefully deficient in their general education, and this is, in many cases, a drawback of no small importance to themselves, the profession, and the community at large. I should think means could be easily devised by which the standard of necessary education might be raised to such a height as would be both beneficial and acceptable to all, and especially contributory to the dignity of the profession, pharmacy being, in the highest and most exalted acceptance of the word, 'a science.'"

An eminent and honored pharmaceutical teacher of this College, the late Professor Parrish, a man of extended experience and observation, based upon unusual opportunities of comparing students of medicine, many of whom had the advantage of academic study, with students of pharmacy whose preliminary education as a rule had been cut short, states as his conviction that what is "most needed in pharmacy is a higher grade of preliminary education." Were such references necessary, we could extract voluminously from the most authentic sources to sustain this view. "The needed element to secure successful attainment in any effort to raise the influence and standing of such a body of men as pharmacists, in their relation to the public and to medical science, is to be found in education—scholastic, technical, or scientific." There are five points or specifications which indicate clearly the purpose of preliminary examination, and the conditions which make such a method a necessity of the present time. They are as follows:

First. The imperfect mental training with which so many young men commence their so-called scientific work.

Second. The large proportion who present themselves for class teaching without any genuine intention of mastering the sciences taught.

Third. The generally prevailing intention to make as little knowledge as possible suffice to carry candidates through the examination,

vention of 1852, when the American Pharmaceutical Association was organized, a committee, consisting of Wm. Procter, Jr., S. M. Colcord and G. D. Coggeshall, reported as follows: "*Proprietors* often do not consider the fitness of applicants, both as regards natural endowments and preliminary education, with that care and attention that a due regard to such applicants demands."—EDITOR AM. JOUR. PHAR.

and the habit of regarding the passing of the examination as the chief purpose of that knowledge.

Fourth. The difficulty of properly estimating the true value of what an examinee appears to know, due in great part to complete ignorance of his previous training, and therefore doubt as to whether the answers given be a mere effort of mental retention, or the expression of an understanding that has really grasped the subject.

Fifth. The want of a legitimate relationship between pharmaceutical education and pharmaceutical examination.

So important has this subject become in the deliberations of the Board of Trustees, and so imperative seems to be the demand from the profession at large for some radical change in the methods of receiving matriculants, that, by a resolution, the subject was committed to the Permanent Committee on Instruction, who were directed to submit the question to the members of the College. This committee, pursuing the object of their instructions, addressed, in printed form, four interrogatories, as follows, requesting answer:

First. Do you favor a preliminary examination of students applying for matriculation in the Junior Class of the College?

Second. What branches of English education should be included in such examination?

Third. Should any knowledge of the Latin language be included?

Fourth. What should be the extent or limit of such examination?

The replies came in due time, and, with suggestive views on the lateral question, formed a part—an interesting part—of the committee's report. A compilation of the answers showed that the majority were decidedly in the affirmative upon the leading question, and in some cases remarks were appended giving positive favor to the adoption of some such form of preliminary examination as would not only test the educational acquirements, but the practical experience as well, of the applicant in advance of his admission.

However disproportionate the expressed sentiment of the Board of Trustees may be upon this immediate question, there is a striking unanimity of favorable opinion in the more open and extended membership of the College. The Committee on Instruction evidently felt the weight of this, for the chairman, *ungenerously*, we thought, sought to lessen its effect by alluding to those favoring the plan as a class guilty of lack of personal interest in their general duties to the College.

Upon the acceptance of the report of this committee it was further

resolved to make this subject one of special consideration and discussion at a stated meeting of the College in May next.

It will thus be seen that the preliminary plan is *not* substituted, as we think has been erroneously supposed by some, by the present tentative, but will yet come before the body of the College at the time designated for final adjustment.

One of the objections frequently urged against the adoption here of a radical reform, such as preliminary examination, is the possible result to the financial interests of the College, and grave apprehension has pictured a diminished roster, a corresponding loss of revenue, and a number of other effects which timid minds view with alarm. But what, we ask, have these considerations to do with that which is involved in correct principle? Are we to measure the value of the professional status of pharmacy by the pecuniary interests of this or any other College? What interests have this body of Trustees (with some individual exceptions) in the revenues of the institution except to meet its obligations and sustain the dignity of its various departments? all of which can be well and faithfully done by more conservative management.¹

When, some five or six years ago, the University of Pennsylvania, the oldest and most distinguished institution in the country, took the initiative, so far as its own medical school was concerned, in adopting the graded system of education, it was not without expressed fears and misgivings. The change was construed to mean a loss of students, for many men would naturally go where they could get their diploma most easily, rather than where they would have to work the hardest for it; it meant a loss of revenue, and it meant a great many things which the imagination viewed with fear. But the Trustees and the Faculty rightly felt that it would be even better for the leading medical school of the country to graduate *one* well-equipped physician than a hundred or so who had simply crammed for their final examination, and they resolved to proceed. The result has more than justified the wisdom of their resolution. The diploma of the medical school of the University of Pennsylvania *now* means something.

¹ It seems but fair to state. in this connection, that the College has always fearlessly incurred obligations, when it was necessary, for advancing the cause of pharmaceutical education, by erecting suitable buildings and providing facilities for instruction; and that the College has also recognized it as a duty to cancel these obligations as rapidly as was consistent with her best interests, thereby keeping the credit of the institution free from reproach.—EDITOR AM. JOUR. PHAR.

With such precept before us, no apprehension need be entertained that the honorable prestige of this College will suffer decline. Its standing among the similar institutions of the country has steadily advanced, as its present character and popularity amply testify. Its various scientific departments have been entrusted to able hands—the seniors of its faculty stand eminent in their profession—the College has established the most advanced and improved plan of instruction—the public appreciation has been manifested in the throngs of young men constantly eager to embrace that instruction—its methods of education are perhaps superior to any other institution of the land. All this is accorded by the profession as a merited tribute to an honored and venerated alma-mater, and from this profession has come, through many channels of influence, a generous and liberal endorsement. It is this same profession, however, which presents itself here to-day, and asks, in respectful tone, that this College, having reached a wondrous growth of prosperity—having at this time its representatives in every city, town and village of this extended land, shall, halting, interpose its offices to check a tide whose direction and current have overleaped the bounds of safety, and been strong enough in its unchecked flow to exhaust quite all the remunerative resources of pharmacy as a profession, with the result of debasing it to a trade level, without even the dignity of being distinctive in that!

We need hardly pause here to say, that this matter is grave and important. From an intimate association with my confreres of the Board of Trustees who are honored men of matured thought and sound judgment, we recognize a disposition in determining this question, to be considerate, just and fair to those upon whom the greater exactions in the future may fall, but at the same time there is resolution to perform that which their duties as guardians of a trust impose, among these a duty which now seems to be demanded by the common professional welfare of pharmacy.

It is not assumed, nor is it asserted, that this College, or other similar institutions are wholly responsible for the present status of pharmacy educational and moral, but it is contended that the educational colleges constitute an essential part in a common agency, in which whatever of responsibility exists is divided, and believing that by the adoption of a better system of discrimination in its proteges this College *can* elevate the standing of pharmacy, and relieve itself of all reproach; such course impresses itself upon the mind as a duty

demanded alike by the welfare of the body and a conscientious regard for the interests of pharmacy.

Let me ask you whether you think it an overdrawn statement, that scores of young men who having attempted pharmacy as a pursuit, without fitness, suddenly confronted with a realizing sense of the arduous task before them, diverted from any inclination to the pursuit of study by the exactions of business, placed at many, and serious disadvantages—without qualified instructors—promised a knowledge of the business, but never permitted to use the means of attaining it, should eagerly grasp at any other prospect than the tedium of shop study, should present themselves here under a pardonable delusion that this College can assume the entire charge and responsibility for their complete and perfect education, and ultimately go forth under the still worse self-delusion that they have obtained it?¹

William Procter, a man eminent and honored throughout the world wherever pharmacy is known, whose memory is revered here with profound respect, whose mind was instinctive with the best interest of pharmacy, writes editorially in the JOURNAL as follows, April, 1871: "No amount of *tuition by lectures* will be equivalent to that which the earnest student receives in the dispensing shop under the personal instruction of a well qualified pharmacist who takes an interest in his pupil;" again on the same subject, in 1871, he says, "It is not to be expected that a large proportion of students of pharmacy can get the tuition they need in college schools, and it is time that some efforts should be directed by *disinterested* (disinterested so far as any connection with the College was concerned, we presume) members of our profession towards encouraging this home effort among the present generation of apprentices and assistants;" and again in 1869, "An apothecary without shop experience is like a medical graduate without hospital or other practice. They are both of doubtful reliability."

Let us go back to the earlier history of this College, and dividing its term of existence into periods, note some significant facts. The College was incorporated in 1821—five years elapsed before any graduate went forth—taking the period from 1826 to 1869, inclusive—forty-three years—we find by the record that this College graduated 701 young men, or an average of $16\frac{1}{3}$ per year—now observe—that in

¹The College still adheres to its By-law as rigorously as it ever did, viz., that the candidate for the diploma shall "have served an apprenticeship of at least four years with a person or persons engaged in and qualified to conduct the drug business."—EDITOR AM. JOUR. PHAR.

the fifteen years following the average number has reached 994, almost a 100 each year. We present this statistical statement without comment, although it would be a matter of interest to connect cause and effect.¹

It must be borne thoughtfully in mind in considering this subject that with the growth of this College handsome pecuniary interests have also grown and continue to increase—interests which, if kept subservient to the ethical status of the College and of the profession, would be looked upon simply as gratifying evidence of prosperity, but which, if permitted to exercise their natural influence, are at variance with and inimical to those principles of ethics controlling professional welfare. Professor Parrish, an eminent authority, writing in 1854, see "*Am. Jour. of Pharm.*," page 215, Vol. ii, No. 3, says, "Against the establishment of numerous schools of pharmacy there lie many objections founded upon the difficulty of maintaining them, and upon the almost inevitable lowering of the standard of graduation consequent upon this kind of competition."

A conviction now well settled in the public mind and largely added to by the expressions of the public press, is that the degree granting institutions of this country have let go the old-time safeguards and entered into an era of business rivalry. That the diploma has lost a measure of its credit of value, except as a testimonial of a certain amount of zeal and industry in the pursuit of study.

By a retrospect of the history of this College we are able to ascertain something of its origin and the causes which promoted it. As original members whose connection with the College dates with the beginning, ten respected names appear, seven of whom were, we believe, classed in the directory of the day as wholesale druggists. From this and other historical information which surrounds its foundation and early history, we are led to believe that it had its conception in the fact that the assistants of the wholesale stores were deprived of that important rudimentary education of greater familiarity with drugs which the retail shops at that time so well afforded, and this disparity of opportunities resulted in throwing upon the profession a class of illy-informed men, many of whom, by drift of circumstances, ultimately found their way into retail establishments as assistants or principals and thus ignorance multiplied. In other words, the original object of

¹There are about 28,000 proprietors of drug stores in the United States; how many of these are Graduates in Pharmacy?—EDITOR *AM. JOUR. PHAR.*

this institution was to afford a theoretical knowledge of pharmacy as a science, and to inculcate a better comprehension of its collateral branches of botany and chemistry, which latter, particularly, the too limited (at most) term of apprenticeship failed to afford.

We here assert without fear of reasonable contradiction that it never was the intent and purpose of this institution in its foundation, or subsequent course, to assert the prerogative or office of imparting *full* and *complete* instruction in a vocation which includes mechanical scope, nor to arrogate to itself any broad scheme of education which should profess to supercede that practical information which the shop only and no other means could properly supply.

It has been the expressed conviction of the most eminent men in the profession since the early history of pharmacy in this country that the art, or the rudimentary branches, without which no deep foundation of requisite knowledge can be had, could be better acquired in the work shop, implement in hand, with tutoring oversight than by any theoretical instruction away from familiar surroundings, and that the mechanical principles involved in the various operations to be performed, can only be impressed and comprehended by renewed and repeated familiarity with the processes themselves. This seemed to apply with greater force to pharmacy than to any other of the higher occupations, because its work is not only scientific but mechanical, and with manual dexterity must go a certain amount of reasoning power, and the combined working and thinking were calculated to make a deep and lasting impression upon the expanding mind, which no amount of didactic or superficial teaching could equal.

To quote too freely in illustration of what we present would be to impose too much upon your time, but we desire at this point to refer to the general remarks on this subject in the syllabus of study prepared for students by William Procter, under the auspices of the American Pharmaceutical Association, printed in the Proc. of 1858, also to the article of Edward Parrish, published in the proceedings of the American Pharmaceutical Association of 1872, "On the preliminary education of apprentices"—these two articles from the pens of honored authors, now deceased, seem like legacies left for our benefit, and will well repay perusal by those interested in this subject.¹

¹ We agree with the author that the papers alluded to should be regarded as legacies from men who were eminent as pharmacists and as teachers of pharmacy. Prof. Procter's views on the preliminary education of apprentices are given in the foot-note on page 66, those of Prof. Parrish in the paper mentioned above, which was the last one

A reference to the numerous articles extant, and to the public utterances of the most observant minds of earlier pharmacy, indicate one general view of this subject, and this view, that the shop tuition and practice was the one vital principle underlying all true foundation of pharmaceutical knowledge, and that, without this, no apprentice to pharmacy could be prepared for the higher attainments in scientific knowledge, that this training should preferably precede, or be coincident with collegiate courses, and that the two should be so fitted and adapted as to secure the best results to the student.

If we turn a look of inquiry into the existing condition of pharmacy of this country, and compare it with that of twenty years since, we will observe a marked decline; its *morale* is not what it then was, its *personnel* has undergone most distinctive change, and that essential *esprit du corps* which should characterize a body of scientific men is totally lacking. The value and usefulness of its offices are still recognized, but its representatives fail to command that public respect and confidence accorded to those of former years. Instead of the merchandizing features of the business being auxilliary to the scientific art, the latter is only an appendage to the former, and if the mere insignia of the occupation be taken away there would be scarcely features enough left to recognize pharmacy. A groundling and mercenary spirit has absorbed the ethical sentiment, and pharmacy seems to be threatened with disintegration. If asked to trace these results to a cause, we should ascribe them to an occupation vastly over-crowded. An occupation no longer remunerative as a distinct vocation, it has become naturally subservient to the arts of trade, as evidenced by the inroads of manufacturers, the adoption of nostrums and quackery, the piracies of commerce. That a spirit of rivalry in the collegiate institutions has had much to do with augmenting the ranks of pharmacy, we think none will deny. The temptation has been great to open wide doors to the clamoring throngs seeking admission to educational methods, which promise a comparatively quick and easy accomplishment of a work, the work of a life otherwise tedious and difficult!

The statistics of the census show a ratio of one apothecary to every

written by him on a pharmaceutical subject a few months before his death; the paper concludes with the following earnest advice (italics our own): "Let our Colleges then be *kept open to all*, let their instructions be popularized and made as comprehensive as possible, and while we seek gradually to raise the standard of graduation, let us *not choke the entrance to the schools* by restrictions calculated to exclude those *who most need their instructions*."—EDITOR AM. JOUR. PHAR.

1,500 of population in the city of Philadelphia; in the country at large the proportion is as one to 1,800.

There has been a steady growth of business rivalry in the more prominent pharmaceutical institutions of this country; some have wisely withdrawn from all competitive effort, and such course has been received with approval. The future work and standing of these institutions will give ample evidence of a wise foresight.

The University of Michigan was the first institution in this country, we believe, to take the long, bold stride of graduating pharmacists without any requirement of preliminary educational or shop training. The action of the Michigan University was not without remonstrance, but this was answered with the ingenious plea that the College was not engaged in making mere ready tradesmen in pharmacy, but of preparing men for higher and more responsible positions, educating scientific experts, drug assayers, toxicologists, men habituated to accuracy, etc.; presuming such to have been a *bona-fide* intention, would the country find a need of so many men to fill positions only casually made necessary? No; and we believe the view was firmly maintained that it was an unsafe departure from time-honored precedent, and could end only in degeneracy and demoralization, but it marked, as we have said, a step in the methods of rivalry.

If time permits, suppose we look a little farther, and compare pharmacy in its status or standing with its associate profession, medicine. Here are two professions, whose offices, both liberal and humane, whose educational requirements include the same general scope of study, yet differ so widely, in the public respect, deference and appreciation. We believe not as a pharmacist, but as an honest conviction, that a thorough pharmacist requires a better education than his medical brother, and yet medicine takes higher social rank than pharmacy; yea, higher scientific rank. That this should be the case must be explained by the fact that the votary of medicine, deservedly, has the credit of being the better equipped of the two in educational advantages. And there are many who hold to the opinion that pharmacy will never take equal rank *with* medicine until it includes in its *personnel* a more considerable proportion of well educated and cultured men.

Pharmacy it must be borne in mind draws its recruits from the great middle classes, including the better educated laboring element, who seeking more remunerative occupations for their wards, and being

yet too limited in means to bestow a liberal education, the sons must be at labor at an early age for self-sustenance, thus trenching, through necessity, upon those precious years of tutelage, and finally launching them into some pursuit (it may be pharmacy) for which they are in no manner qualified.

Does the literature of the pharmaceutical profession of this country give any evidence of the value of its scientific education? We think not; there is an apparent absence of effort, and no especially important contributions emanate from American authors, in the line of valuable research and discovery, a fact of significance to those prone to boast of improved methods and enlarged opportunities.¹ Take the higher type of our own periodicals, take our own offspring, the "American Journal of Pharmacy," and from what source does it derive its best material? Most certainly from the close and thorough students of that grand old Empire, Germany, comes an everflowing flood of light and knowledge; "an empire upon whose educational system (pharmacy included) all others, with some modifications, are formed; an empire which has for generations been rearing up a complete system of education for all classes, which whilst it lays foundation broad and deep in general culture, directs at the same time mental research into the channels of art and science, and fosters this with a wisely guiding and directing hand."

The present condition of pharmacy in England and America are somewhat similar; the same determining causes exist there as here, with the same general result. Complaint loud and persistent has awakened our transatlantic brethren to a realizing sense of a profession imperilled, and they have instituted as prerequisites to pharmacy, individual capacity, educational fitness, preliminary training, and are seeking parliamentary enactment to protect the commercial features of the business.

If we take a view of pharmacy of Continental Europe, we find a wholly different condition prevailing, a high educational requisite prescribed by law, in some countries a governmental supervision and control, territorial limitation to business, legal sanction and license, each and every one of which exactions aims to secure, and it unquestionably

¹ We are not disposed to overrate the importance of contributions to pharmaceutical knowledge from American authors; yet it is but proper to state that such papers receive due attention on the other side of the Atlantic, and are, as a rule, regarded as possessing practical—if not scientific—value.—EDITOR AM. JOUR. PHARM.

does secure, for the profession, its highest possible attainment, dignity and usefulness.

The question of pharmaceutical education assumed great prominence at the meeting of the International Pharmaceutical Congress, held in London, August, 1881. The various representatives of pharmacy, in reply to interrogatories, gave statements of the legal and professional status of pharmacy in France, Italy, Sweden, Denmark, Belgium, Holland, Austria and Hungary. In all of these countries the Government controls pharmacy. The standard of education is prescribed and rigidly determined, and there are special laws bearing upon the relation of pharmacy to the State and to the public. Such restriction would be obnoxious, and difficult of imposition in a country like this, but the main point which is essential to our purpose here is to show the universally admitted importance of the first progressive step, preparatory education.¹

The code of ethics of this College—the moral law, upon which all provisional should be based, in paragraph 9, on the subject of apprentices in their relation to this Institution, reads thus: "It is recommended that those applicants who have had the advantage of a good preliminary education, including the Latin language, should be preferred" in the selection.² A law of essential importance, yet heretofore openly disregarded by non-compliance, ever since the time, perhaps, when oral examinations were discontinued, a method *immensely* superior to that now adopted, for through it examiner and examinee were brought into close personal relation, and the former had many opportunities of ascertaining the proficiency of his pupil in general culture by conversational tests, opportunities which are now wholly shut out. A student in the processes of examination, as subsequently conducted, may be profoundly ignorant of all else; his chirography may be bad, his etymology even worse, yet an acute mental retention, in a certain line of instruction, may save him from failure.

It has been stated that this College would have no legal right to bar out candidates. The preamble to the charter refutes such idea, in the

¹This preparatory education is required in the countries named, as it is in England, before the young man can become an apprentice in pharmacy.—EDITOR AM. JOUR. PHAR.

²The quotation refers to the selection of apprentices by employers and members of the College; the subject of preliminary examination before entering the College is not alluded to, directly or indirectly, in the code of ethics, charter, constitution or by-laws.—EDITOR AM. JOUR. PHAR.

language which says: "to dispense and prepare drugs and medicines requires knowledge and skill of a peculiar kind," "it is the duty of good government to protect its citizens from ills and dangers," "instituted (the College) for the purpose of cultivating, improving and making known a knowledge of pharmacy and its collateral branches of science."

In the application of these remarks, in so far as they may apply to all interested, no spirit of unkindness exists; nor tendency to deter the earnest and thoughtful student from the pursuit of a study congenial to his tastes and inclination. Pharmacy *wants* cultured and educated men, *needs* them urgently to raise up the status of a dignified and worthy profession; but she wants none to venture under a self-imposed conviction that the path to her portals, and through her broad fields of science is smooth, straight and easy of pursuit. This College is eager to extend to all fitted aspirants a helping hand, and extending to these her offices, share in the pride of their success and future eminence. The range of studies required to fit the man has become so wide that a great part of his preparation *must* be accomplished before the College assumes the guardianship of his further progress; if deferred until afterwards, the deficiency will *never* be made up. The Philadelphia College of Pharmacy is not willing longer to assume the risks of the past. A sound elementary and rudimentary instruction *before* collegiate courses will make the students' instruction here a matter of far more easy comprehension, and when the final test comes he falls back upon a well-grounded structure of preliminary knowledge, with a self-dependent feeling of confidence greatly to his credit and advantage. This College, like a parent, feels the greater pride in her brightest children, but nevertheless with true parental instinct she *loves* them all.

PHILADELPHIA, January 20, 1885.

USE OF COCAINE.—Dr. Jelinek obtained temporary relief in a case of painful deglutition by applying to the back part of the mouth a ten per cent. solution of cocaine (*Wiener Med. Woch. Schr.*) Dr. Murrell has used cocaine hydrochlorate in neuralgia, relief being afforded by hypodermic injection; but he prefers a 20 per cent. solution of the salt in oil of cloves, of which from 5 to 10 minims are rubbed in with the finger.—*Brit. Med. Jour.*

SPIRITUS AMMONIAE AROMATICUS.

BY ANDREW BLAIR.

Read at the Pharmaceutical Meeting, January 20, 1885.

It is a very important matter that all preparations, especially of a medicinal nature, should be, as far as it is possible to make them, permanent in appearance, taste, smell and activity. About a year ago, the attention of the writer was called to a lot of aromatic spirit of ammonia, of which complaint had been made on account of its deep red or brown color. This was very marked, and so much so as to induce an examination of the cause.

If we look at the Pharmacopœia of 1870, we find the following formula:

R	Carbonate of ammonium.....	3i
	Water of ammonia.....	f 3iii
	Oil of lemon.....	f 3iiss
	Oil of nutmeg.....	℥xl
	Oil of lavender.....	℥xv
	Alcohol.....	Oiss
	Water, q. s. ft.....	Oii

This preparation has been satisfactory, and no occasion to modify, improve or alter it has ever existed, that the writer is aware of. It is permanent in its color to a marked degree, the change in 18 months being so slight it is hardly worth noticing. (See sample No. 1.)

Let us now look at the formula in the Pharmacopœia of 1880, and we find it contains:

R	Carbonate of ammonium.....	40 parts.
	Water of ammonia.....	100 "
	Oil of lemon	12 "
	Oil of lavender.....	1 "
	Oil of pimenta.....	1 "
	Alcohol, recently distilled and kept in glass vessels.....	700 "
	Distilled water, q. s. ft.....	1,000 "

(See sample No. 2, which changed to its present color about a month after it was made.)

In the main it is like the formula of 1870, the only difference being in one of the flavoring constituents. Investigation determined that this trifling change was the cause of the trouble. Why such an alteration to a formula that has been satisfactory for 10 years or more it is

hard to understand, unless the idea prevails that with each new issue of our official book of formulas some changes "must" be made, or the revisers will be accused of neglecting their duty.

A condition of the formula of the Pharmacopœia of 1880, which the writer did not regard in making these samples, is the use of "recently distilled" alcohol. How many pharmacists have "recently distilled" alcohol, or would be able to procure it when making aromatic spirit of ammonia; or who would take the trouble to make it when needed for such preparation? This is one of the many absurd hindrances put in the way of pharmacists by the revisers of the last Pharmacopœia, to discourage and in some instances absolutely prevent them making their own preparations, except at very great cost, and by unnecessarily complicated and tedious processes, thereby encouraging them to buy the ready-made goods provided by the host of wholesale druggists who supply all and everything ready made that the Pharmacopœia contains. The simplest preparations, such as paregoric, Huxham's tincture, and such like, are now supplied by the gallon, and at prices in some cases, forced by close competition, that, counting the cost of "good" ingredients, would leave no margin or profit for the maker.

The causes of or advantages derived from the change in the preparation under consideration is wrapped in mystery, as far as the writer's knowledge goes. Such changes are an injury rather than a benefit.

To conform as much as possible to the official formula, the writer has been in the habit of using that ordered in the Pharmacopœia of 1880, using oil of nutmeg instead of oil of allspice, and disregarding the order to use "recently distilled" alcohol. The formula reads thus:

Carbonate of ammonium.....	40 parts
Water of ammonia.....	100 "
Oil of lemon.....	12 "
Oil of lavender flowers.....	1 "
Oil of nutmeg.....	1 "
Alcohol.....	700 "
Distilled water, q. s. ft.....	1,000 "

and you have the result in sample No. 3, which has now been made over a year. It has been and is satisfactory in every way, and needs no improvement.

For sake of comparison, there are here samples made within the past 24 hours according to the Pharmacopœias of 1870 and 1880.

PROXIMATE ANALYSIS OF THE BARK OF FOUQUIERIA SPLENDENS.

BY HELEN C. DE S. ABBOTT.¹

In the published proceedings of the Mexican Boundary Survey of 1859, conducted by General William H. Emory, are found numerous references to *Fouquieria splendens*. No region of equal extent presents more marked illustrations of the relations of the vegetation of a country to its topography and geology than that lying along the Mexican boundary line. The traveler traversing the desert table-lands will not fail to unite in his recollections of these tracts the dull foliage of the creosote bush, the palm-like Yucca, and the long thorny wands of the *Fouquieria splendens*. The vegetation of the El Paso basin and the Upper Rio Grande valley is described as strikingly different from that of the immediately adjoining country; new and strange plants are seen on every side. Upon the table-lands many plants grow not to be found in the more fertile valleys; among these is *Fouquieria*, a tree locally known by its Mexican name ocotilla. A full description of the appearance of the plant is given in the Mexican Boundary Survey; also one in an article by Edward Lee Green.² The author describes *Fouquieria splendens* in these terms: "It is a splendid oddity and not more odd than beautiful, flourishing in great abundance in many places. It grows to the height of from eight to twelve feet, and in outline is quite precisely fan-shaped. The proper trunk, usually ten to twelve inches in diameter, is not more than a foot and a half high. A few inches above the surface of the sands this trunk abruptly separates into a dozen or more distinct and almost branchless stems. These simple stems rising to the height of eight or ten feet gradually diverge from one another, giving to the whole shrub the outline of a spread fan. Each separate stem is clothed throughout with short gray thorns and small dark green leaves, and terminates in a spike, a foot long, of bright scarlet trumpet-shaped flowers. The stems are not so thickly armed with thorns, but that they can be handled if grasped circumspectly, and being very hard and durable, as well as of a convenient size, they are much employed for fencing purposes about the stage

¹ Paper read before the Chemical Section of the American Association for the Advancement of Science, at Philadelphia, 1884, by H. C. De S. Abbott.

² Botanizing on the Colorado Desert, "American Naturalist," 1880.

stations and upon the ranches adjoining the desert." The author states: "Give a skillful Mexican ocotilla poles and plenty of raw hide thongs and he requires neither nail nor hammer to construct a line of fence, which for combined strength, neatness and durability fairly rivals the best work of that kind done in our land of saw-mills and nail factories."

The plant is botanically described under the order *Tamariscineæ*, tribe III, *Fouquieræ*, new genus and species.¹ For other sources of information see "A Tour in New Mexico;"² and in "Plantæ Wrightianæ Texano-Mexicanæ."³ The writer has not been able to find any notice of chemical studies made upon it.

The specimens of ocotilla, at the writer's request, were collected and transmitted from Lake valley, Southwest New Mexico, through the kindness of Professor E. D. Cope. The portions of the stem, similar to those used in the analysis, vary in diameter from an inch to an inch and a half. The bark shows a thickness of over an eighth of an inch, and is of a sage color generally. The exterior surface is made rough by an interlacement of hard projecting material; some of the smaller stems are encircled with the gray thorns described, arising in regular series from the projecting portions of the bark. Between the interlacements are oblong and diamond-shaped intervals, which are filled with superimposed layers of a yellowish color and looking as if coated with a wax. They appear to be cemented together by a glistening substance which on warming the bark exudes and possesses a resinous or gum-like consistency.

In the present investigation, the scheme proposed by Dragendorff⁴ has been followed out, with the exception of the maceration at the ordinary temperature; an apparatus similar to the one devised by Tollens⁵ has been used for the extractions. The air dried material reduced to a very fine powder was again dried at 100° C. giving 9.4 per cent. moisture. The great importance of powdering the material for the various estimations as insisted upon by Dragendorff⁶ was fully confirmed in these examinations. Quantitative determinations with

¹ Bentham and Hooker. *Genera Plantarum*.

² By Dr. N. Wislizenus.

³ Gray, *Smithsonian Contributions to Knowledge*. Vol. iii, Part i, p. 85 and Pt. ii, p. 63.

⁴ *Plant Analysis, Qualitative and Quantitative*. G. Dragendorff, Ph.D. Translated from the German by H. G. Greenish. London, 1884.

⁵ "Zeitschrift f. anal. Chemie," xiv, 82, 1875, and xvii, 320, 1878.

⁶ *Loc cit.*

ocotilla bark reduced to fine pieces gave 2 per cent. and 3.5 per cent. less than the percentage obtained from the estimations with the powdered substance. Determination of total ash gave 10.26 per cent.; a qualitative ash analysis showed the presence of calcium, magnesium, aluminum, potassium, sodium and a trace of iron, sulphates, phosphates and chlorides.

Ten grammes of the air-dried powder treated with petroleum spirit of boiling point 46°C . extracted a substance without aromatic odor, communicating to the liquid a light color. From 100°C.C. a measured portion was evaporated for determination of total amount of substances brought into solution. The residue dried at 100°C . gave 9 per cent., at 110°C . 8.87 per cent., at 120°C . 8.875 per cent. and a loss of .125 per cent. showing scarcely appreciable trace of volatile oil. The remainder of the petroleum spirit extract on evaporation at the ordinary temperature left a solid yellowish-green wax substance of specific gravity .984, melting from 84°C . to 85°C ., insoluble in water, slowly soluble in boiling 95 per cent. alcohol, readily in absolute alcohol, in cold ether, chloroform, amyl alcohol, benzol, carbon disulphide, oil of turpentine and linseed oil; slightly dissolved in aqueous alkalies, but not saponifying with them. It is colored yellow by nitric acid, acted upon by concentrated sulphuric acid, and not by hydrochloric acid nor aqua regia. By means of combining sulphuric acid and solvents, I was able to obtain several color reactions that may prove upon further investigation of value in identification of the different vegetable waxes. With Japanese wax, the only specimen of vegetable wax, I could obtain, the color reactions differed in each test from the substance under consideration. The following color reactions were obtained with the petroleum spirit residue. When small fragments were stirred on a watch crystal with two or three drops of concentrated sulphuric acid of 1.84 sp. gr. the substance at once changed color to a clear garnet red and was slowly dissolved by the acid, the liquid remaining colored; with different portions of the red acid liquid stirred on a watch crystal with various solvents used in excess, it was noted as follows: With absolute alcohol the color was instantly dissipated leaving a white precipitate; petroleum spirit discolored the acid solution, leaving no precipitate; ether discolored with gray precipitate; chloroform changed the red acid liquid to yellow, no precipitate; with benzol the red color was changed to snuff-brown gradually passing to red-brown; amyl alcohol gave a rose-pink and slowly passing through varying

tints to a fine purple. So called pure amyl alcohol was used and when tested did not give a color reaction alone with sulphuric acid. The petroleum spirit residue on boiling with absolute alcohol and when warm, thrown into several times its volume of cold water separated out as a white cloud.

Employing a method by which melissyl alcohol has been obtained from Carnaüba wax,¹ the petroleum spirit residue was submitted to a like treatment. It was boiled with alcoholic potash and saponified, the alcohol distilled off and lead acetate added; a heavy light-yellow colored precipitate formed, and on boiling yellow masses separated out. They were washed, dried, and boiled with absolute ether. The filtered liquid on cooling deposited a yellow crystalline substance, which on heating on platinum foil turned black and disappeared. Beyond ascertaining the fusing point, solubilities, and color reactions, the substance was not further examined. It was found to fuse between 43° C. and 60° C., the greatest change occurring between 57° C. and 60° C.; to be soluble in chloroform and ether; scarcely soluble in cold absolute alcohol; very slightly soluble in boiling 95 per cent. alcohol; not acted upon by nitric acid nor aqua regia. Sulphuric acid dissolved the substance and gave an orange color reaction discolored on adding alcohol, ether, chloroform and ammonia to the acid liquid, with no precipitate; with amyl alcohol a pale rose pink quickly fading, and with benzol a brown color, were obtained. The color tests differed from those obtained with the substance before saponification and treating with boiling ether, indicating that the petroleum spirit residue can be separated into at least two substances and possibly more, which remain to be determined by a future study.

The powder exhausted by petroleum spirit, was dried and similarly treated with absolute ether as in the previous extraction. The ethereal extract of a greenish color gave an acid reaction with litmus, and on addition of alcohol the liquid became turbid. Spectroscopic examination failed to detect the characteristic chlorophyll bands. The ethereal residue on evaporation presented differences in color and solidity from the petroleum spirit residue. It was quite brittle, and was not appreciably softened at 120° C. It gave when dried at 100° C. 4.52 per cent. solids extracted, at 110° C. 4.44 per cent. and at 120° C. 4.42 per cent. The residue when evaporated at ordinary temperature was

¹ Liebig, *Annalen*, 183, p. 344; *Watts Dict. Chem.*

insoluble in petroleum spirit, slightly soluble in 95 per cent. alcohol and carbon disulphide, quite soluble in cold absolute alcohol, amyl alcohol, chloroform, benzol and oil of turpentine. Nitric acid gave no reaction. With sulphuric acid and small portions of the ethereal residue, I obtained a dark mahogany color. This solution on adding absolute alcohol was partially discolored, no precipitate. With ether the sulphuric acid solution gave a greenish precipitate, with amyl alcohol the acid solution was discolored changing to pale red, then green. These tests show in each case a wide difference in color reactions from those obtained with the petroleum spirit residue. The amount of solids taken up on treating the ethereal residue with water was .36 per. cent. The aqueous liquid was neutral to litmus, portions tested for alkaloids gave negative results; on warming and addition of dilute sulphuric acid, Fehling's solution was reduced, indicating possibly glucosides. The portion insoluble in water was then treated with absolute alcohol. The liquid gave an acid reaction with test paper. A measured part of the liquid was evaporated and the weighed residue showed 1.6 per cent. of solids dissolved. The residue from the evaporated alcoholic liquid was partially dissolved by aqueous alkalies. It readily saponified with alcoholic soda, forming a soft brown soap, which on boiling with lead acetate yielded a yellow precipitate. This was collected on a filter and washed. When the precipitate was boiled with absolute ether and the filtrate allowed to slowly evaporate, a white organic crystalline substance separated out. Under the microscope particles of coloring matter were found to be interspersed among the crystalline structures.

The indications would show an acid resin to have been extracted by the ether.

The ten grammes of powdered bark, after exhaustion with petroleum spirit followed by absolute ether, were treated with absolute alcohol. A measured quantity of the alcoholic extract was evaporated in a weighed platinum dish, dried until weight noted was constant. After incineration the amount of ash was found to be .15 per cent. of the original material. The alcoholic extract for determination of total amount of organic solids dissolved, was evaporated in a current of carbonic acid, when the residue dried gave 8.6 per cent, and 7.98 per cent. of solids respectively. A cloudiness formed on the addition of water to the residue, which cleared up on addition of alkalies. It was restored by acid. The aqueous liquid gave precipitates with calcium

and lead salts. It reduced Fehling's solution on adding dilute acid and warming. Negative results followed tests for alkaloids. Treating with two volumes of absolute alcohol, according to Dragendorff for detection of gum, vegetable mucilage was separated. Tests failed to detect the presence of tannin.

The residue of the powdered bark, after exhaustion with absolute alcohol, was treated with cold water. A deep red mucilaginous liquid which became frothy on shaking, was extracted. The amount of solids in this solution, on evaporating the liquid and weighing the residue was found to be 19.11 per cent.; in absence of acid or boiling glucose was identified by Fehling's solution, also by Mulder's test. A gum separated by absolute alcohol and quantitatively estimated, showed 4.8 per cent. of the amount of substances dissolved in water. The powdered residue, after treatment with water, was macerated with dilute acid, and gave negative tests for alkaloids. The extraction with caustic soda for identification of albuminous substances, followed by chlorine water for the estimation of lignin and cellulose, have not yet been determined.

The results of the proximate analysis, as so far completed, may be stated as follows:

Moisture.....	9.4
Petroleum spirit residue.....	9
Ethereal residue.....	4.52
Alcoholic residue.....	8.6
Water residue.....	19.11
Total ash.....	10.26
Alcoholic extract ash.....	00.15
	<hr/> 61.04

The difference of 38.96 per cent. would include pectose, coloring matter and cellulose or woody fibre.

Petroleum spirit extracted a solid substance, yellowish green in color of sp. gravity .984, melting from 84° C. to 85° C., insoluble in water slightly soluble in boiling 95 per cent. alcohol, soluble in absolute alcohol, cold ether, chloroform, amyl alcohol, benzol, carbon disulphide, oil of turpentine and linseed oil. It was slightly acted upon by aqueous alkalies; but readily saponified with alcoholic soda. Treating the soap with lead acetate and boiling the precipitate with ether, a yellow crystalline substance was obtained, melting from 43° C. to 60° C. Sulphuric acid combined with solvents gave characteristic

and distinct reactions with the yellowish-green petroleum spirit residue, and with the crystalline substance separated from it.

A scheme has been proposed for the identification of various waxes based upon quantitative experiments.¹ The examination rendered division into two groups possible, according to the solubilities of the waxes with chloroform. Again their action with ether, and acetate of lead solution added to the alcoholic solutions, allow the several varieties of waxes to be distinguished from each other.

The petroleum spirit residue was submitted to the tests proposed in Hirschsohn's scheme. It was boiled with ten times its volume of chloroform and when cool the liquid became cloudy. By this test the petroleum spirit residue was placed in the group with Carnaüba and Bahia wax. An ethereal solution of the petroleum spirit residue, on adding an equal volume of alcohol, remained clear. According to Hirschsohn's Scheme,² an ethereal solution of Bahia wax similarly treated remains clear, and by this means the wax is distinguished from Carnaüba wax, which it is said to resemble in most of its properties. The wax from *Copernicia cerifera*, the Carnaüba tree of Brazil, and Carnaüba wax obtained from the leaves of *Corypha cerifera*, are related very closely by their chemical properties and possibly are identical.³

Carnaüba wax is described as a clear yellow wax with a greenish tinge, and harder than bees' wax. It contains a notable percentage of free melissyl alcohol and other alcohols very difficult to separate. Insoluble in water, it is dissolved with difficulty by alcohol and ether, though readily soluble in carbon disulphide and oil of turpentine. It is not acted upon by linseed oil; it is changed yellow by nitric acid; with sulphuric acid no appreciable effect. The melting point is variously stated from 82° C. to 85° C. The specific gravity from .998 to .999.

A table of the specific gravity of the different kinds of waxes prepared by Dietrich⁴ shows the density of animal wax to be notably low compared with vegetable waxes. Allen⁵ states that the presence of

¹ Contributions to the Chemistry of several varieties of wax, by E. Hirschsohn, Pharmaceutical Journal and Transactions, vol. x, March, 1880.

² Loc. cit.

³ Gmelin. Handbook of Chemistry, vol. xviii. Translated by H. Watts, London.

⁴ E. Dietrich. Specific Gravity of Wax. Journal of Chemical Society, 1882, vol., xlii, p. 1139.

⁵ A. H. Allen. Commercial Organic Analysis. (Also see in same work tables of sp. gr. waxes.)

vegetable wax in adulterations of bees' wax is positively established if the density of the sample exceed .970.

By the method followed out in this analysis, petroleum spirit extracted from the powdered bark a substance of constant melting point which is identified as a wax. It resembles, in its ethereal solution not clouding on addition of alcohol, Bahia wax; in melting point and specific gravity, Carnaüba wax, also the latter wax by its insolubility in water and action with nitric acid. It differs from Carnaüba wax in its greater degree of solubility in absolute alcohol, ether and aqueous alkalis. Linseed oil is an active solvent for it, but does not dissolve Carnaüba wax. The color reaction of the petroleum with sulphuric acid have been described above. It is stated that sulphuric acid produces no effect with Carnaüba wax.¹

The wax obtained from the bark of *Fouquieria splendens* differs generally in its properties from known vegetable waxes, and is evidently a new wax, peculiar to this plant. I propose that it be called *Ocotilla wax*.

In the ether, absolute alcohol, and water extracts, the presence of an acid resin, a white crystalline substance, gum resin, glucose, possibly glucosides, gum, and a red coloring matter were indicated.

The investigations described in the preceding pages were conducted in the Chemical Laboratory of the Philadelphia College of Pharmacy, August and September, 1884.

THALLINE is said to have been used successfully in a large number of cases in the clinic of Professor Nothnagel, and has the constitution of a secondary chinoline base, being one of a number of chinoline derivatives prepared by Professor Skraup, and is represented by the systematic name "tetrahydro-parachinanisol." The salts of this base, which have an acid reaction, are all freely soluble in water, and have the property of forming green compounds when treated with solution of ferric chloride and oxidizing agents. On account of this peculiarity, the cumbersome systematic name has been dropped in favor of the shorter designation "thalline" (θαλλίς). The hydrochlorate, sulphate and tartrate of thalline and the hydrochlorate of ethylthalline are the salts that have been used, and these are said to show great antipyretic activity in doses of quarter, half and three quarters of a gramme, a point in which thalline would seem to compare favorably with some of its competitors. The lowering of the temperature is said to take place gradually and to last a considerable time, whilst it is not accompanied by any secondary disturbances. Thalline can be conveniently administered in wafers containing a quarter or half of a gramme of the sulphate.—*Phar. Jour. and Trans.*, November 29, 1884; *Phar. Post*.

¹ A. B. Prescott. Outlines of Proximate Organic Analysis.

SOME NATIVE SOUTHERN REMEDIES.

By H. H. RUSBY, M.D., Detroit, Michigan.

The following information is taken from the author's paper, based upon a report and collection of plants sent him by Dr. E. W. Lane, Scarboro, Ga.

NATURAL ORDER SARRACENIACEÆ.

1. *Sarracenia variolaris*, Mx., Spotted Trumpetleaf, Spotted Pitcher Plant, Spotted Side-saddle Flower, or Small-pox Plant, reported under the additional name of the "Hood-topped Fly-catcher." The last name possesses interest as being the first reference in the common names to a peculiarity of this and other species of the genus, which has lately been the subject of special scientific investigation, namely, their carnivorous habits. A narrow line of sugary secretion is deposited on the outside of the pitcher-shaped leaves, running from near the ground up to the edge of, and a little way down into, the cup. Insects ascending and feeding from this viscid line, become intoxicated by the time they have reached the interior, and fall into the fluid contained within the leaf. This fluid contains a substance closely akin to the gastric juice, by means of which certain portions of the insects' bodies are digested. This proteid matter is then absorbed. The only medical virtue heretofore attributed to this genus is that of a small-pox specific, which, as pointed out by Dr. Lyons, is probably on the "absurd theory of signatures." But Dr. Lane describes it as tonic and slightly anodyne, and of use in dysenteries. These properties would seem to accord well with the physiological habits above given. A secreted substance capable of intoxicating insects would be likely to give it "slightly anodyne properties," and its digestive principle would be likely to render it tonic. As to its use in dysenteries, its abundant astringency would render it serviceable in diarrhœas which often assume a dysenteric type, but scarcely in a real dysentery. The same remarks are applicable to the next and other species of *Sarracenia*.

2. *Sarracenia flava*, L., the Yellow-flowered Pitcher-plant, etc., now reported as the "Umbrella-topped Fly-catcher."

NATURAL ORDER CALYCANTHACEÆ.

3. *Calycanthus levigatus*, Willd. Sweet-scented Shrub. Reported as "Southern Peruvian;" the bark said to have done good service as a tonic and anti-periodic.

NATURAL ORDER LEGUMINOSÆ.

4. *Phaseolus diversifolius*, Pers. Wild Bean. Reported under the name of "King Cure-all." It grows in sand, from an immense, stout club-shaped root, which abounds in starch. It is reported as beneficial to dyspeptics, the root being chewed and the saliva swallowed. The doctor judges the benefit to be derived from the increased amount of saliva swallowed.

NATURAL ORDER RUBIACÆ.

5. *Galium pilosum*, Ait., var. Hairy Bed-straw. Reported as "Snake-bite-weed" and "Flux-weed," and the absurd name "Four-corners-of-the-earth," which last it has probably received in allusion to its four-angled stem. It is one of the innumerable weeds, of which every village has one or more, said to be a specific for the bite of the rattle-snake and other venomous creatures, and without much doubt worthless in this respect. Belonging to a family which yields the cinchonas and other powerful stimulants, and being so near to the *Galium aparine*, L., it very possibly has medicinal properties; but the objection to the property here proposed rests on our knowledge of the nature of the rattle-snake's venom.

NATURAL ORDER COMPOSITÆ.

6. *Eupatorium fœniculaceum*, Willd., the Fennel-like Boneset. Reported as the "White-flowered Dog-fennel" (but the true Dog-fennel is *Anthemis Cotula*, L.). Dr. Lane testifies to it as a strong diuretic and one used with success for both man and beast. One pint of the strong decoction is an effectual drench for horses afflicted with "what is commonly called gravel."

7. *Eupatorium perfoliatum*, L. Boneset or Thorough-wort.

8. *Eupatorium rotundifolium*, L. Reported under the name of "Wild Horehound."

9. *Eupatorium aromaticum*, L. Reported as "Upland Wild Horehound." The report on the three last confirms the well-known properties of these plants. It is a noteworthy fact that *E. fœniculaceum* should possess such marked diuretic power, while its congeners are nearly or quite deficient in that respect.

10. *Sericocarpus tortifolius*, Nees. One of the White-topped Asters. Reported as "Edgeweed," and said to be useful for colic in horses.

11. *Solidago odora*, Ait., the Odorous Golden-Rod. Used as a styptic; in the case of wounds, by applying the bruised plant; in the case of epistaxis, by snuffing up the powdered dried leaves. It may be

noted here that attention has recently been called to the fact that in certain parts of the country an infusion of the leaves of this plant is very generally used as a beverage, as a substitute for tea, a regular trade in the article having sprung up in the shops.

12. *Chrysopsis graminifolia*, Nutt., the Grass-leaved Silver Aster. Reported as "Blue-grass" and "Fever-grass." Used as a poultice to sprains.

13. *Helenium nudiflorum*, Nutt., the Naked-flowered Sneezeweed. Report refers to its well-known irritating properties when applied to the nostrils.

14. *Gnaphalium purpureum*, L., the Purple-flowered Everlasting. Reported as "Cough-weed," and as a remedy for coughs and colds.

15. *Gnaphalium polycephalum*, Mx., the Sweet-scented Life-everlasting. Reported as a diaphoretic and a poultice in tympanitis.

16. *Pterocaulon pycnostachyum*, Ell., the Indian Black-root. Said to possess tonic and emmenagogue and oxytocic properties. The latter is an interesting announcement as bearing on its well-known narcotic properties.

NATURAL ORDER GENTIANACEÆ.

17. *Gentiana ochroleuca*, Froel., the Sampson Snake-root. Dr. Lane confirms its value as a substitute for the other gentians.

NATURAL ORDER LOGANIACEÆ.

18. *Gelsemium sempervirens*, Ait., the Yellow Jessamine. Concerning this, the most important and valuable upon the list, and one of the most valuable plants in the entire materia medica, the doctor speaks in no stinted terms. In his hands, and in the hands of his acquaintances, it has sustained the reputation it has generally gained. An interesting fact is that a majority of the country practitioners in that section prepare their own extracts, using eight ounces of the bark of the green root to the pint of dilute alcohol. If this practice is general throughout the south, it would materially affect the estimate of the consumption of this drug.

NATURAL ORDER AMARANTACEÆ.

19. *Telanthera polygonoides*, Moq. Reported under the name "Piss-a-bed," and as a diuretic and anti-spasmodic, used in cases of strangury.

We would repeat that it is most desirable that similar reports, accompanied in all cases by specimens showing as much as possible of the plant, mailed flat between sheets of pasteboard, should be contributed, particularly from the south and southwestern regions.—*Therap. Gaz.*, Dec., 1884, p. 546.

THE DISPUTED IDENTITY OF THE RED BARK OF THE
NILGIRIS.

BY W. T. THISTLETON DYER, C.M.G., F.R.S.

Assistant Director, Royal Gardens, Kew.

I cannot but regret that Mr. Cross has reopened in the pages of the "Pharmaceutical Journal," a question which I imagine most persons interested in the subject had hoped had been finally laid to rest.¹

In 1880, Mr. Cross was employed by the India Office to take out to the Nilgiris the plants of Santa Fé and Carthagená barks which had been under his charge in the Royal Gardens, Kew. After successfully accomplishing this difficult task, he remained in India for some time in charge of the plants.

Early in 1882, I received a letter from Mr. Clements Markham, inclosing one from Mr. Cross, dated Government Gardens, Ootacamund, 21st January, 1882. From this I extract the following passage:

"After the fullest and most careful examination of Neddivattum plantation, I found that the most stupendous mistake that has ever occurred in the history of planters has been committed. The whole plantation, instead of consisting, as was believed, of pure *succirubra*, does not contain more than 5 per cent. of that species, the remaining 95 per cent. being of the gray bark or Huanuco sort, which, botanically, is either the *C. micrantha* or *C. peruviana*."

Mr. Cross subsequently wrote to Kew, March 21, 1882, to much the same effect.

The Government of Madras regarded Mr. Cross's statements as of sufficient importance to deserve careful investigation. Surgeon-Major Bidie, M.B., Superintendent of the Government Central Museum, Madras, was accordingly instructed to report upon them and to make a careful collection of specimens of every kind of cinchona grown at Naduvattum for transmission to Kew.

Surgeon-Major Bidie met Mr. Cross at the plantations, and with regard to the question raised he reported to his Government, March 3, 1882:

"With reference to the assertion that the tree called by us *Cinchona succirubra* is a gray bark, *C. micrantha*, my first act was to show Mr. Cross exact reproductions of Fitch's plates of the two species¹ but without any

¹ See paper by Rob. Cross' on page 96.

² From Howard's "Nueva Quinologia of Pavon."

names attached, and as he hesitated about giving an opinion as to which was the red bark, I did not then push the inquiry further. Subsequently, while collecting botanical and bark specimens, I was in daily intercourse with Mr. Cross, but found that he was immovable from his assumption that a mistake had been committed as regards the identity of the red bark tree.¹ I attach no importance to this however, for, notwithstanding his presumed familiarity with the botanical characters of the red bark, he took nearly a year to arrive at this conclusion and never even hinted at the possibility of such an error when in constant communication with a botanical expert like Colonel Beddome. In my opinion there can be no doubt that the tree known as the *Red bark* on the Government Plantations is the *Cinchona succirubra*, Pav., and it does not seem necessary to occupy the time of Government in offering proofs that such is the case, although for my own satisfaction I went carefully through all the botanical evidence on the subject."

The Governor of Madras, Mr. Grant Duff, himself no mean botanist, had previously looked into the matter personally. I quote the official minute in which he records his own opinion:

Minute by the Right Honorable, the Governor, dated January 26, 1882.

"Para. 9. From Ootacamund I went on to Neddiwuttum, where Dr. Bidie was established, busily engaged in examining our plantations with Mr. Cross and making a most complete collection of all those specimens which would be required for finally setting to rest the doubts as to the genuineness of our *succirubra* with which Mr. Cross fluttered us a few weeks ago. Col. Jago was most anxious that Mr. Cross should have the fullest opportunity of stating his views to me, untrammelled by the presence of a third person. We went accordingly alone into the woods together, and he pointed out to me what he called 'true *succirubra*,' '*succirubra* of the Pata variety,' and '*micrantha*.' Colonel Jago then joined us and we went together to one of the trees, which our people have hitherto believed to be *micrantha*, and read the description of the tree under its branches. Most unquestionably the tree that we have hitherto called *micrantha*, and not the tree which Mr. Cross has now taken it into his head to call *micrantha*, is the *micrantha* of the books; that is, the *micrantha* heretofore known to botanists. The distinctions between it and any form of *succirubra* are most clearly marked, and are infinitely wider than the distinction

¹ His Excellency, the Governor, on his visit to the estates, at once saw Mr. Cross's error, and pointed it out to him, but he still adhered pertinaciously to his assertion.

between the two varieties of *succirubra*, one of which, Mr. Cross, who never was, I believe, in the *micrantha* country, which lies far to the south of the district which he knows so well, has recently christened *micrantha*.

"10. I left our plantations with no shadow of doubt upon my mind, and wish all botanical questions were as easy. I may add, too, that I, on more than one occasion, introduced the subject while in the Wynaad, with a view to seeing whether Mr. Cross's doubts had created any alarm among the planters; but I found them treated, on all hands, as illusions."

At Kew we had exceptional opportunities for testing immediately the accuracy of Mr. Cross's statements. Colonel Beddome had sent us a splendid set of dried specimens of every *cinchona* form grown in the Nilgiris, on which we reported early in 1882. Besides these we possess in the case of *C. micrantha* authentic specimens of the South American plant collected by Weddell and by Pritchett, in addition to what is presumably a type from Ruiz and Pavon's herbarium. Besides abundance of Indian specimens, we have one in particular known to have been raised at Ootacamund from Pritchett's seeds, and the accurate determination of which has been verified by Howard. In the case of *C. succirubra* we have Spruce and Cross's own specimens from the slopes of Chimborazo and a specimen, presumably from Ruiz and Pavon's herbarium, verified by Howard. Colonel Beddome's admirable specimens were carefully examined by my colleague, Professor Oliver, the Keeper of the Kew Herbarium, and he found no reason to doubt that the species of *Cinchona* which passed as *micrantha* and *succirubra* on the Nilgiris were what they professed to be. Dr. Trimen, the Director of the Royal Botanical Gardens, Ceylon, also examined them (together with the further set collected by Dr. Bidie) with me while he was at home on leave in 1882, and we could see our way to no other conclusion.

Finally, Dr. Trimen, at the invitation of the Madras Government, visited their *cinchona* plantations in 1883, and reported upon them.

What he says on the subject of the red bark may be taken as the last word in the matter:

"*C. succirubra*, Pav.—In regard to red bark I can very confidently endorse the opinions expressed by all the botanists who have examined the matter, that the well-known tree which forms the bulk of Naduvatom is

the true *C. succirubra*, Pav. I have examined Pavon's own specimens in the British Museum, which precisely correspond with the ordinary red bark of India, Ceylon and Jamaica."

Mr. Cross has further expressed the opinion, in which he has received more independent support than in the other case, that the hybrid form commonly met with in our Indian plantations, and now generally known as *Cinchona robusta*, is identical with the *Pata de Gallinazo* of Chimborazo.

In this identification I equally disagree with him. As the investigation of the matter led to a good deal of correspondence, I cannot do better than quote the passage from the Kew Report for 1882 (pp. 38, 39), in which the net result of the whole discussion is briefly summarized by Sir Joseph Hooker:

"*Cinchona robusta*.—In the Kew Report for 1881, pp. 25, 26, I referred to the hybrid between *succirubra* and *officinalis*, which seems in the east first to have made its appearance in Ceylon, and thence to have been introduced by seed into the Sikkim plantations.

"This form has, during 1882, given rise to a rather protracted correspondence with the Madras Government. Mr. Cross, who was employed by the India Office to convey the Columbian barks from Kew to Southern India, insisted that the two supposed hybrid forms grown on the Nilgiris, under the names of *pubescens* and *magnifolia*, were not hybrids but distinct species, of which the seed had been sent by himself from the slopes of Chimborazo. After some shifting of opinion, he seems finally to have settled down to the statement that *magnifolia* was the *Cinchona* called in the Chimborazo bark district 'Pata de Gallinazo,' that *pubescens* was true *succirubra*, and that the *succirubra* of the Madras plantations was *micrantha* (gray bark).

"In all these identifications his recollections of plants seen no less than twenty years before seem to have misled him. Unfortunately, his views were, to a certain extent, adopted by the eminent quinologist, Mr. Howard, and it therefore became necessary to critically examine them, as such gigantic errors in nomenclature could not but very seriously affect the future policy of administration of the Madras cinchona plantations.

"Under instructions from the Madras Government, very copious and carefully prepared sets of all the Cinchonas cultivated in the Nilgiris were despatched to Kew, both by Colonel Beddome and by Surgeon-Major Bidle, the Superintendent of the Madras Central Museum. They were very thoroughly examined, and there appeared no valid reason for disputing the accepted names under which the plants had been grown or for adopting those assigned to them by Mr. Cross.

"The authentic specimens of the Pata de Gallinazo, collected by Spruce, and described by him in his official report, are preserved in the Kew Herbarium. They have been subsequently identified at Kew by Spruce (con-

firmed by Howard) with *C. erythrantha*, Pav., and Triana, the most recent monographer of the genus, has referred this species as well as Spruce's specimen to *C. pubescens*, Vahl. Neither the *magnifolia* nor *pubescens* of the Nilgiri plantations can in any way be confounded with *Cinchona pubescens*, Vahl, but are, no doubt, as has always been contended, marked members of the variable series of hybrids which appear to invariably arise in plantations where *officinalis* and *succirubra* are cultivated in proximity.

"Mr. Cross's other two conclusions proved equally baseless. As, however, these questions of synonymy had excited a good deal of perplexity in Ceylon as well as in Southern India, I suggested to the Government of Madras that Dr. Trimen, the Director of the Royal Botanic Garden, Peradeniya, should be invited to visit the *Cinchona* plantations of the Madras Government, in order to bring about, if possible, some uniformity of nomenclature in the forms and species of *Cinchona* cultivated both in Ceylon and Madras. This he accordingly did, and he has given the results of his exhaustive study of the whole question in a very able and lucid report (dated June 30, 1883), which, representing, as it also does, the opinions arrived at by the Kew staff, appears to me to finally dispose of the whole subject. Both the names *pubescens* and *magnifolia* Dr. Trimen, for reasons which he gives, proposes to discard in favor of *robusta* which is in use on some estates in India, and 'is now commonly employed in Ceylon for the trees in question.' Dr. Trimen describes those he saw on the Nilgiris in the following words: 'I found the forms to be just those so common in Ceylon plantations. Generally robust well-grown trees, larger, hardier, and healthier than either the *officinalis* or *succirubra*, among which they were scattered, and often flourishing where neither of them can thrive. Botanically, there was the same range of variety, the extreme form in one direction, with its dark green smoothly shining leaves, closely approaching some of the large-leaved forms of *C. officinalis*; and that in the other direction with its larger, paler, thinner leaves, more or less pubescent beneath, so close to the hairy form of *C. succirubra* as to be often with difficulty distinguished from it. Between these, as regards color and pubescence, were many intermediates, though, undoubtedly, with a little ingenuity, the whole can be thrown into two groups.'

"He further adds: 'We have direct testimony of its origin. I am assured by planters of credit that they have grown both glabrous and pubescent *robusta* from seed of ordinary *officinalis*, and that it is by no means unfrequent for seedlings of them to appear in seed-beds on estates where no trees but *officinalis* and *succirubra* occur. I have myself seen seedlings of *robusta* self-sown where there are no parent trees of the sort whence they could have been derived; and at one time I was inclined to regard it merely as a variety of *officinalis*. There are, I think, grounds for believing that *succirubra* generally supplies the pollen, and is, therefore, the male parent, both in the case of *robusta* (*succirubra* and *officinalis*) and *anglica* (*succirubra* and *Calisaya*).'"—*Phar. Jour. and Trans.*, Dec. 20, 1883.

PARALDEHYDE IN MENTAL DISORDERS.—Benda has used paraldehyde as a hypnotic in 34 cases of mental disorder, in doses varying from f ʒss to f ʒli. In 16 cases sleep was produced; in the remaining cases the action was uncertain or entirely negative.—*Med. and Surg. Rep.*, Nov. 29, 1884.

RED BARK.

BY ROBERT CROSS.

A little over two years ago, after arrival on the Nilgiri hills, in Madras, with a collection of cinchona plants—for which I was sent by the India Office to South America—I called attention to the mistake which had been committed in planting at Naduvatum and other places on the hills a comparatively useless cinchona, the Huanuco bark of Peru, for the true “red bark” of Chimborazo, *Cinchona succirubra*, plants of which were dug up by myself on the slopes of that mountain and brought direct to India twenty years previously. To those who thought I might be mistaken in my assertions I may say that, after having dressed and transplanted the original stock of “red bark” plants *twice* in their native forest, I would just as likely be liable to mistake my own handwriting.

At the time of the introduction of the cinchonas into India it so happened that the Huanuco and “red barks” reached the Nilgiris about the same time, were propagated in the same hothouse, and so had become indiscriminately mixed up together. In this way the “red bark” was lost sight of, and was mistaken for the Huanuco species, which it resembled in the form and color of the leaves, especially when forced in a hothouse. As the plantations grew up a sprinkling of “red bark” trees were found thinly dispersed therein. Had the two sorts been kept carefully separate the loss experienced by planters and others would have been avoided. An examination of the cinchona blue books will show that it never was intended to cultivate the Huanuco bark to any extent.

In India, as in South America, two distinct varieties of “red bark” are observed. One of these, which possesses smooth foliage, is called by South American collectors *Pata* bark; while to the other, the leaves of which are hairy underneath, the term *teja* or “tile” bark is applied. These sorts are not kept separate in commerce. The *Pata* sort, however, seems to inhabit a rather higher zone on the mountain slope, and so may prove hardier than the other. Probably both varieties are of equal merit as quinine-producing plants.

Before leaving India I collected a little bark of both sorts for purposes of comparison, together with a few samples of “crown” bark. Most of the samples were taken from renewed trees, the aim being to

secure as near as possible bark of each sort of the same age. Yet it will be understood that, even among trees of similar size, one tree from any particular circumstance may develop slightly thicker bark in the same space of time than another which may be growing under more modified conditions. The trees selected were growing at the same general elevation. The special objects in view were:

1st. To compare the yield of the *Pata* with the "tile" bark.

2d. To place these two sorts against "crown."

3d. To observe the increase of alkaloid which takes place as the bark grows older.

To the obliging kindness of David Howard, Esq., F. C. S., I am entirely indebted for the examination of the samples, a copy of which is annexed.

No.	Analysis of samples referred to by D. Howard, Esq., F. C. S.	Quinine sul- phate, per cent.	Quinine alka- loid, per ct.	Cinchonine alkaloid, per cent.	Cinchonidine alkaloid, per cent.	Quinidine al- kaloid, per cent.
1...	True "red bark," <i>C. succirubra</i> , Teja, or "tile" variety of South Ameri- can bark collectors, one year old renewed bark.....	5.32=	4.00	1.42	0.66	0.14
2...	True "red bark," <i>C. succirubra</i> , "tile" variety, two years old renewed bark.....	4.40=	3.30	trace	0.23	0.06
3...	True "red bark," <i>C. succirubra</i> , <i>Pata</i> variety, one year old renewed bark	5.68=	4.26	trace	0.08	0.08
4...	True "red bark," <i>C. succirubra</i> , <i>Pata</i> variety, two years old renewed bark.....	5.82=	4.37	trace	0.32	0.17
5...	"Crown," one year old renewed bark.....	2.60=	1.95	trace	trace	0.18
6...	"Crown," two years old renewed bark.....	3.10=	2.33	0.17	0.06	0.17
7...	"Crown," three years old renewed bark.....	7.64=	5.23	0.38	0.48	0.66
8...	"Crown," four years old renewed bark.....	8.80=	6.60	trace	0.12	0.37
9...	"Crown," apparently original bark. Tree twelve years old.....	12.30=	9.22	0.00	0.12	0.64
10...	Root bark from large primary roots of true <i>C. succirubra</i> , <i>Pata</i> tree, 20 feet high.....	4.68=	3.51	2.10	2.26	0.77
11...	"Crown," a variety with small leaves, the <i>Paramo</i> bark of Loxa collectors, three years old renewed bark.....	6.28=	4.69	1.03	0.48	0.34

I beg to direct attention to the small proportion of the inferior

alkaloids contained in the bark when compared with the yield of quinine. It seems to me that when really good sorts of trees are properly cultivated and carefully managed, a steady yield of the best alkaloids may be relied on. It would, I think, be important to ascertain the highest *sustained* yield of quinine that any or all of the best species can attain to. On this, in my opinion, rests the future prosperity of planters wherever bark trees are cultivated.—*Phar. Jour. and Trans.*, Dec. 13, 1884, p. 463.

PINE OR FOREST WOOL. (WALD-WOLLE. LAINE DES BOIS.)

BY THOMAS GREENISH, F.C.S., F.R.M.S.

About the year 1840 a new and curious industry sprang up at a place called Humboldtsau, or the Meadow of Humboldt, situated near Breslau, Upper Silesia, which, like most novelties, had for several years to struggle with difficulties before it could be said that its position was established,—that, in fact, it occupied a place in the estimation of the public or was noticed by the medical profession. This industry consisted in the utilization of the acicular leaves or leaflets of the pine in the production of a substance to which the name “Wald-Wolle,” rendered pine or forest wool, was applied; and it evidently extended itself, for there subsequently arose new manufactories at Remda in the Thüringen-Wald; at Jonköping in Sweden; Wageningen in Holland; as well as in some parts of France.

Schledel, in his “*Waaren-Lexicon*,”¹ mentions this substance under *Wald-Wolle*, and describes it as “the fibres of the needles of *Pinus sylvestris*, also of the black pine, *Pinus niger austriaca*, fabricated after the process introduced by Joseph Weiss, of Zuckmantel, Austrian Silesia. When prepared, it resembles horsehair, and has been used for stuffing mattresses, which purpose it seems to have fully answered, and the mattresses stuffed with it possess an aromatic odor. In the process of its manufacture a volatile oil is obtained called *Wald-wolle-öl*, or forest-wool oil, which is used as an external application in rheumatic affections. The *Wald-wolle* products can be procured in Berlin, Vienna, Leipzig, etc.”

¹ Sixth edition. Leipzig, 1850.

According to Hager,¹ Weiss used the fibre of the pine leaf in the manufacture of paper, and observed that those workmen who happened to be afflicted with gout or rheumatism were relieved by the application of the pine-needle products. Hence their introduction as remedial agents into medical practice.

Simmonds, in his "Dictionary of Trade Products," calls the article pine-needle wool or pine-wood wool, "a fibrous vegetable substance obtained in Prussia by treating the buds and leaves of coniferous trees with a strong solution of carbonate of soda. The fibre, so obtained, is used there for upholstery purposes, such as stuffing for mattresses, intended as a protection against insects, and also for wadding; blankets are made with it; and oil and soap are also obtained from it."

The term pine-wood-wool is incorrect, and confounds this with a very different article, called "Holz-wolle," also of German origin, consisting of the pine wood reduced to a coarse fibrous powder, an article which impregnated with bichloride of mercury is now recommended as an antiseptic dressing in surgery.

In the "Journal d' Agriculture pratique,"² there is an article by Professor Charles Morren—mainly a translation from the *Bernische Blätter für Landwirthschaft*, January, 1852, "Note on the Vegetable Wool extracted from the Leaves of the *Pinus sylvestris*," of which the following is a summary: In the neighborhood of Breslau, in Silesia, in a property called the Meadow of Humboldt, there exist two establishments—one a factory where the leaves of the pine are converted into a kind of cotton, called pine or forest wool; the other an establishment for invalids, where the waters used in the manufacture of the pine wool are employed as curative agents, affording relief to the sufferers from rheumatism. Both of these owe their existence to Monsieur De Pannewitz, inspector of forests and inventor of a chemical process, by means of which there is extracted from the long and fine pine leaves a fibrous substance called forest wool, because it curls, felts, and can be spun as ordinary wool.

The wild pine, from which this wool is obtained, is much esteemed in Germany for its many valuable properties, and instead of leaving it to its natural growth, extensive plantations are cultivated, and the use Monsieur De Pannewitz has made of the leaves will contribute to extend the cultivation of the pine in other countries.

¹ "Pharmaceutische Praxis".

² Vol. v, 1852, p. 322.

The acicular leaves of pines, firs, and conifers in general, are composed of a bundle of fine and tough fibres, surrounded and kept together by a resinous substance. Boiled with an alkali, the resinous substance is dissolved, when it is easy to separate the fibres and to wash and free them from all foreign substances.

According to the process employed and the leaves used, the woolly substance is of a fine quality or remains in a coarser state.

In the first case it is used as wadding—in the second for upholstery purposes.

The first use that was made of this filamentous substance, was to substitute it for cotton or wool wadding in quilted blankets. In 1842 the hospital of Vienna bought 500 of these blankets, and after a trial of several years a further supply was ordered. It was observed that under the influence of pine wool no noxious insects sheltered in the beds; it was found also that the aroma was agreeable to the occupants. Soon after the workhouse of Vienna was furnished with similar quilted blankets.

Similar articles, as well as mattresses, stuffed with the wool, have been used in the hospital of charity, in other hospitals at Berlin, and in the barracks of Breslau.

An experience of five years in these establishments has proved that articles made of pine wool are very useful and durable, never troubled with moths and only one-third the price of horsehair. Besides, it can be spun and woven. The finest quality gives a yarn resembling hemp and equally strong. Spun and woven as cloth it yields a fabric that may be used for carpets, horse blankets, etc. The exhibitors of these products were awarded a bronze medal at the Exhibition of Berlin, and a silver one at that of Altenburg.

Such is the account given by Professor Morren of the pine-wool productions, but I am informed that the quilted blankets referred to by him are not now used in the Vienna Hospital, straw having superseded the pine wool as a stuffing for mattresses.

Bentley¹ says: "From the leaves of this species (*Pinus sylvestris*), the substance called pine wool or fir wool is prepared. It is used for stuffing mattresses, etc., and is said to be repulsive to vermin. Wadding for medical use, and cloth for various articles of dress, etc., are also manufactured from these leaves."

¹ "Manual of Botany," 1882, p. 678.

Martindale¹ thus refers to it: "Fir wool or fir-wool wadding, obtained from the pine leaves, is sold as a brownish-yellow fibre, in sheets like cotton wool. It has a faint agreeable odor of the pine leaf, and is manufactured into blankets, jackets, spencers, stockings, etc."

The two last authors refer to the source of true pine wool, but describe an entirely different article.

In the "National Dispensary," Stillé and Maisch refer to these products, and state that "the leaves of the different species of pine, when distilled with water, yield volatile oils, which differ from the volatile oils obtained from the resin of the same species. Such an oil is known, and to some extent employed in Germany as *Fichtennadelöl* (fir-leaf oil), and the leaves by pounding are converted into a fibrous substance known as *Fichtenwolle* (fir wool)."

I am indebted for samples of the true pine or forest-wool, wald-wolle, to M. Bernardin, Musée de Melle, Belgium, to Herr Dittrich, Prague, and to Dr. Maschke, in Breslau. I have also received two samples from S. Graetzer, of Carlsruh, the depot for conifer preparations of Humboldtsau. These two differ in quality; the finer is labelled "adapted for coverlets," and the coarser for "stuffing cushions." This substance, more or less fine, and with a faint pine odor, constitutes the article known as Wald-wolle, pine or forest wool, throughout Germany and the Continent generally, and all authorities to which I have had access agree as to its origin, the pine leaf; its character, a fibrous substance; and the several uses previously enumerated, to which it has been applied with more or less of success.

Some eminent members of the medical profession on the Continent have spoken favorably of these pine-wool productions, but whether they deserve or not the high encomiums passed on them it is nevertheless an important fact that a material, before considered almost useless, is now converted into articles of domestic utility.

The several samples just referred to, more or less coarse, of a reddish-brown color, as forwarded to me from those different sources, were subjected to a careful histological examination, and were found to be composed of the tissues of the pine leaf.

Fig. 1 is a transverse section of the leaf of *Pinus sylvestris*, and presents to the naked eye three very distinct tissues, A, the epidermal layer; B, the fibro-vascular bundles, composed of bast and wood cells; C, the parenchymatous chlorophyll tissue, with the oleo-resin secret-

¹ "Extra Pharmacopœia," 1883, p. 216.

ing cells; and *D*, the parenchymatous tissue surrounding the vascular bundles.

Fig. 2 shows the tissues of which these fibrous substances are composed. *A*, the epidermal tissue, a series of elongated cells alternating with a series of tabular cells, the latter containing the stomata; the side walls have an undulating outline, so that the adjoining cells fit into each other. The parenchymatous tissue within the epidermal layer and that surrounding the vascular bundles, fundamental tissue, being thin and delicate, is for the most part disintegrated and destroyed in the process for the preparation of the wool, leaving the more tenacious epidermal cell tissue (*A*) with the fibro-vascular bundles, represented by *B* the bast cell, and *C* and *D* annular and spiral vessels, as the component parts of this fibrous material.

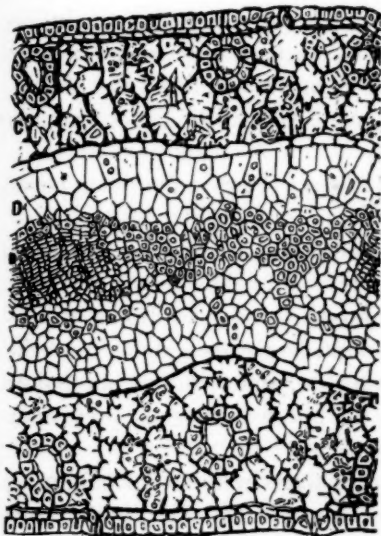


FIG. 1.

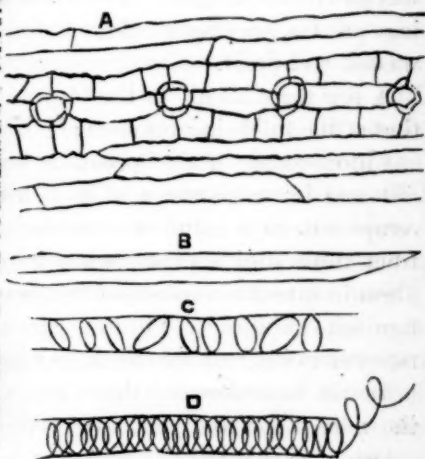


FIG. 2.

The several tissues of each sample were found to correspond with those in the leaf of the pine; there was no tissue found that had not its counterpart in the pine leaf, and the pine leaf being equally examined had no tissue that was not present in the samples of this fibrous material.

It is therefore evident that this fibrous substance, to which the term pine or forest wool was originally applied, and to which it now applies

throughout Germany, the birth-place of the industry, is manufactured from the acicular leaves of one or more species of pine previously exhausted of its volatile oil and extractive in the process of boiling.

There is now in English commerce a fibrous article, in sheets like cotton wool, to which the same names of pine or forest wool, pine and fir-tree wool, pine leaf wool, are indifferently applied. Samples of this substance were obtained from different sources, but they so clearly corresponded that they pointed to one common origin. They were subjected to a micro-chemical and microscopical examination with the view of determining the true nature of an article which is just now, as a fibrous material, and also as forming textile fabrics, receiving more or less of attention from the medical profession as well as the public.

The samples were composed of fine fibres of a reddish-brown color. When boiled in water the color was not affected. Boiled in a solution of caustic alkali a faint pine leaf odor was perceptible and the color was partly discharged. A solution of chlorine completed the bleaching process, leaving a white fibrous material which was afterwards washed and dried.

A few threads only of the bleached fibres were used for the application of the following reagents :

Chloro-iodide of zinc produced a violet tint. A solution of iodine, followed by sulphuric acid, gave a blue color. The fibres dissolved completely in a solution of ammonio-oxide of copper. The results from these simple experiments were sufficiently convincing that the fibres in question consisted of pure cellulose, and not that altered or lignified condition of cellulose which the fibrous materials previously referred to show under the same reagents.

It will be understood that these experiments were conducted under the microscope, and that two or three fibres only were used on each occasion, so that the observer was enabled to follow the delicate reactions which were not visible to the unaided eye. The individual fibres were then placed under the microscope, aided by polarized light, and from their physical characters, which confirmed the results of the previous chemical reagents, it was evident that they were neither more nor less than the unicellular hairs on the outer coat (*testa*) of the seed of *Gossypium* which constitute ordinary cotton, whose habitat is not Thuringia, but rather the Southern States of America or one of the other cotton producing countries of the East, and that it owed its brown

color not to extractive from the pine leaf, but to the application of the usual dyeing material for that purpose. That peculiar epidermal cell tissue which characterizes the pine leaf was entirely absent.

In addition to this fibrous article now described, there is another material called "pine foliage forest wool flannel," hygienic flannel, also "from the forest of Thuringia," claiming public and professional patronage. It professes to be made from the fir wool, the produce of the Black Forest fir, *Pinus sylvestris*. This is a woven material of the same color as that previously described. The warp was detached from the weft in order that they might be examined separately; the warp when the dye was removed corresponded in every respect with the fibre previously examined and behaved in a like manner with the same reagents; in fact it was cotton. The fibres of the weft were next examined. In burning they gave off that peculiar horny empyreumatic odor indicating an animal origin; boiled in caustic alkali they were completely dissolved; examined under the microscope the imbrications on the individual hairs proved previous suspicions to be correct, that this fibre consisted of wool. The woven material was, therefore, a combination of ordinary cotton and sheep's wool, the former probably rather preponderating.

These fibrous materials profess to owe their origin to the leaves of the *Pinus sylvestris*; but the venation of most of the Coniferæ is simple, one single unbranched midrib, and the only available true fibres are the fibro-vascular bundles of this midrib, which are surrounded by parenchymatous tissue. The fibro-vascular tissue of the midrib shows with the previously-mentioned reagents a distinct difference from that of cotton.

It would appear, then, that this "curious industry," consisting in the utilization of the leaves of the pine in the formation of a fibrous material called pine or forest wool, has given birth to another *curious industry*, which is endeavoring to attract the attention of the medical profession; the results of this investigation may assist in determining its true value as an addition to our remedial appliances.—*Farm. Jour. and Trans.*, Nov. 15, 1884, p. 381.

PAIREIRINE HYDROCHLORATE has been found valuable by Dr. Ferreira in chronic cases of latentague, in doses of 2 grams or more a day—*Lancet*, December 6, 1884. This is doubtless the alkaloid of pareira brava, which is better known as *pelosine* and is regarded as being identical with *buxine* and *bebeerine*.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Drosera rotundifolia.—H. Büsgen has made comparative experiments intended to answer the question whether the capture of insects by these and similar plants assists their development. The experiments were made with seedlings grown in peat, which were previously boiled in a nutritive solution; these were placed on saucers and covered with bell glasses; one set were fed with the lice from vine leaves, the other received no such nourishment. The unfed plants were less strong and healthy, 16 plants producing 9 flower branches and 20 capsules, while 14 of the fed plants produced 17 flower branches and 90 capsules; the total dry weight of the fed plants was 0.352, and of the unfed plants 0.119 grams. Other trials under less favorable conditions gave similar results, and the author considers it as proved that the plants of *drosera* are capable of utilizing animal food and assimilating it beneficially for the production of seeds.—*Jour. Chem. Soc.*, 1884, p. 917; *Bied. Centr.*, 1884, p. 47.

Pinus Sylvestris.—Phenol has been found in this tree by A. B. Griffiths, the quantity present in the different parts being in the old stem 0.1021, in the young stem 0.0654, in the leaves between 0.0936 and 0.0315, and in the cones between 0.0774 and 0.0293 per cent.—*Chem. News*, vol. 49, p. 95.

A New Cotton Plant.—For many years A. A. Subers, of Macon, Georgia, has been carefully experimenting to hybridise the cotton plant that grows wild in Florida, with the common okra. The new plant retains the okra stalk and the foliage of the cotton. Its flower and fruit, however, are strikingly unlike either cotton or okra. The plant has an average height of two feet, and each plant has only one bloom. This is a magnificent flower, very much like the great magnolia in fragrance, and equally as large. Like the cotton bloom, the flower is white for several days after it opens, after which it is first pale pink, and gradually assumes darker shades of this color until it becomes red, when it drops. For about ten days the fruit resembles the cotton boll, and then its growth suddenly increases, as if by magic, until it reaches the size of a big cocoanut. Not until it reaches this size does the lint appear. Then its snowy threads begin to burst from the boll, but are securely held in place by the okra like thorns or points that line the boll. One experienced picker can easily gather 800 pounds a day,

and fast hands much more. Each boll produces about two pounds of very long stapled cotton, superior to the Sea Island, and at the bottom of the boll there are from four to six seeds, resembling persimmon seed. This new cotton, therefore, needs no ginning. Such a plant would revolutionize the cotton industry of the South.—*Florida Times-Union*.

Epilobium angustifolium, Linné.—J. W. Chickering, Jr., relates in "Botanical Gazette," that a tract of about four thousand acres of cleared land in Maine, from which the underbrush had been burned in June, was in the following August covered with the plant named flowering. The plant is locally known as *fireweed*, which name is usually applied to *Erechthites hieracifolia*, Rafinesque, and in some localities to *Erigeron canadense*, Linné. *Senecio gracilis*, Pursh, is also said to be called fireweed in some places.

Crescentia Cujete, Linné.—The fruit of the calabash tree was analyzed by Dr. Peckolt, who ascertained the presence of an aromatic compound, bitter principle, two resins, tannin, tartaric acid, malic acid, a dark blue coloring matter, sugar, etc., and isolated, a new acid, named crescentic acid, which is precipitated by lead acetate. An alcoholic extract of the pulp acts as a mild aperient, in doses of 0.1 Gm. and as a drastic without griping, in doses of 0.5 Gm. Boiled with water and vinegar the pulp is used as an application in erysipelas.—*Rundschau*, N. Y., August, 1884, p. 166.

Bartung is a seed in great repute in Persia for dysentery. A sample of the seed received by Colonel Beddome, F. L. S., from Persia, was sowed at Kew, and according to W. T. T. Dyer, turned out to be *Plantago major*. Dr. Forbes Watson in his "Index to Native and Scientific Names," gives the following identifications of *bartung* with various species of *Plantago*, viz., *Pl. lanceolata*, Lin. (Irvine), *Pl. major*, Lin. (Honigberger) and *Pl. Psyllium*, Lin. (Birdwood).—*Phar. Jour. and Trans.*, Aug. 9, 1884, p. 101.

Under the name of semences de psyllium (herbe aux puces) the French Codex recognizes the seeds of *Pl. Psyllium*, Lin., and (?) of *Pl. arenaria*, Waldstein et Kitaibel. The seeds of the latter are somewhat smaller and darker colored than those of the preceding species. The larger and lighter colored seeds of *Pl. Cynops*, Lin., are said to be likewise used as psyllium seed or fleaseed. The mucilage obtained from these seeds is stated to be used in Southern Europe in the finishing processes of muslin.

Soja hispida.—E. Meissl and F. Böcker give the composition of the soja bean, in round numbers, as follows: water 10, soluble casein 30, albumin 0.5, insoluble casein 7, fat 18, cholesterin, etc. 2, dextrin 10, starch 5, cellulose 5, ash 5 per cent., traces of sugar and amido compound.—*Jour. Chem. Soc.*, 1884, p. 918; *Bied. Centr.*, 1884, p. 52.

Bassia longifolia.—E. Valenta ascertained the seeds to contain fat 51.14, alcohol extract 7.83, tannin 2.12, bitter principle, soluble in water 0.60, starch 0.07, mucilage 1.65, soluble albumin 3.60, extractive 15.59, insoluble proteids 4.40, total ash 2.71 (in the soluble portion 0.95), fibre (and loss) 10.29 per cent. The fat is yellow, is bleached on exposure, and soon becomes rancid. It has the specific gravity 0.9175 at 15° C., melts at 25.3°, solidifies at 17.5 to 18.5, and contains considerable quantities of free fatty acids, but only a small amount of glycerol. It is partly soluble in alcohol, entirely soluble in ether, carbon bisulphide, benzene, etc., and contains palmitin and olein. The mixed fat acids obtained from the soap melt at 39.5° and solidify at 38° C.—*Dingl. Polyt. Jour*, vol. 251, page 461.

Oil of Rose has been prepared by Schimmel & Co., Leipzig, from roses grown in Germany; the oil is of a finer aroma than the Turkish oil, and solidifies at 32°C. The congealing point of Turkish oil of rose is given by Baur at between 11° and 16°C. The fusing point of the solidified oil is not given; according to Hanbury's observations (1859), this seems to be higher for oil distilled in northern localities; for oil of rose distilled in London melted between 30.5° and 32.2°C. (87° and 91°F.); Zeller (Studien, 1850) observed 37.5°C. for German oil.

Belladonine.—On boiling commercial belladonine with baryta solution the atropine contained therein is decomposed, and belladonine remains behind as a brown resin, which, according to G. Merling, cannot be crystallized. Its composition is $C_{17}H_{21}NO_3$. Dissolved in diluted alcohol, and boiled with baryta, it yields tropine and several acids, probably tropic, atropic and isatropic acids.

The liquid obtained above, after removing the baryta with carbonic acid, yields to ether several bases, among them the one named oxytropine by Ladenburg (see "Am. Jour. Phar.," 1884, p. 597), which the author believes exists ready formed in commercial belladonine.—*Berichte*, 1884, p. 381–385.

Annatto.—The two principal constituents are *orantin* and *carotin*, the former of which is obtained by digesting 50 Gm. of annatto with 100 Gm. of sodium carbonate in 1 liter of water, and evaporating to one-half, while carotin is prepared by digesting annatto in oil.—*Bied. Centr.*, 1884, p. 215. Carotin was discovered by Wackenroder (1832) in the root of *Daucus Carota*, *Linné*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 20, 1885.

The Pharmaceutical meeting of the College was held this day, Dillwyn Parrish, President, occupying the chair.

The minutes of the last meeting were read and adopted without alteration.

The Registrar presented to the College the report of the Superintendent of Public Schools, and a copy of the work entitled "Elementary Lessons on Electricity and Magnetism," by Silvanus Thompson; also a "Text-book of Physics," by Henry Kiddle; the first being from the Superintendent of the Public Schools, the other two from our fellow-member, Mr. John E. Cook. The thanks of the College were voted to the donors.

A paper upon "The Advantages of Preliminary Examination to Pharmacy and to this College," was read by Mr. Wm. B. Thompson, and on motion of Mr. Blair, seconded by Mr. Hancock, referred to the Committee of Publication (see page 65).

Prof. Maisch afterwards read the resolution which had been offered by Prof. Procter at the first Convention of Colleges, and was adopted.

Mr. Thompson thought that this did not change the spirit of Mr. Taylor's resolution, while Mr. Maisch believed that there was a decided difference, the former aiming at determining the educational acquirements of the young man before becoming an apprentice, and the other subsequently when the young man was seeking further instruction at a college.

Professor Maisch said that he well remembered the excellent paper by Prof. Parrish, referred to by Mr. Thompson, and that from his intercourse with Professors Procter and Parrish he was quite familiar with their views; that while both desired the apprentice to have completed his general education before entering the business, they had considered it wrong to exclude young pharmacists from the College. He said that in Europe the educational standard was determined before the young man was permitted to become an apprentice, but that afterwards he encountered no obstacle in pursuing his studies. In answer to a question by Mr. Blair, he explained that in Germany a young man had to attain a prescribed grade in the classical school, called *Gymnasium*, before he could become an apprentice (*Lehrling*), that his employer was by law compelled to instruct him in practical botany and chemistry, that at the close of his apprenticeship he had to pass an examination as assistant, and after having served for several years as such, could enter, without further examination, the university to

prepare himself for the final examination (Staats-examen) in the higher branches of his profession.

Mr. Blair said that Professor Procter had been in the habit of sending his young men to the College during the first and last year of their apprenticeship.

Prof. Maisch remarked, that at that time the junior and senior students heard the same lectures, and that he had no doubt that with the present graded courses, Prof. Procter would have sent his apprentices for three or four years. Referring to the admitted fact that pharmacy was vastly overcrowded, he said that the same was true of all other professions and trades. Regarding the legal status of medicine he said that the laws recently passed required of a practitioner of medicine the registration of a diploma, and that in Illinois and other States the Board could, and very properly did, discriminate between the schools and would not recognize diplomas from institutions that did not require sufficient preliminary education of their students. Not one of the numerous pharmacy laws required a diploma as evidence of qualification; many recognized pharmaceutical diplomas; a number recognized also medical diplomas; one law discriminated against the schools of other States; several recognized no diploma; but all the laws admitted to the practice of pharmacy those who could pass examination before the appointed Board; even in Philadelphia any person could carry on the drug business after passing the examination before the Board, without ever having been at a college of pharmacy. Prof. Maisch thought that all those who could legally enter the drug business, had a right to be instructed therein, and in his opinion, they deserved commendation, if they were seeking instructions beyond what was legally required of them.

Mr. Daniel S. Jones remarked that he was glad to be present and hear the subject discussed; that many present knew the active interest he had exhibited in the College in years past, and that circumstances rendered it too painful for him to frequent these halls as he formerly did; he nevertheless had a most abiding interest in the welfare of the institution, and he knew the views of those whose opinions had been quoted and how earnest they were in desiring only the best personnel in the ranks of pharmacists; he felt sure that good would come of the discussion of so important a topic.

Mr. Andrew Blair read a very modest advertisement about cod liver oil, which gave rise to considerable amusement. He also read a paper upon "*Spiritus Ammoniae Aromaticus*," showing the advantage of the product of the formula of the *Pharmacopœia* of 1870 over the present official; the paper was accompanied with samples of the respective preparations. On motion, it was referred to the Committee on Publication (see page 79).

Mr. Worthington exhibited a bottle which had been enclosed in a tin can and had contained oil of bitter almonds; the stopper had been left out and the oil had been almost entirely volatilized, covering the inside of the can and the bottle with a film of crystals of benzoic acid, and it was for this reason brought to the notice of the meeting as a curiosity.

There being no further business, on motion, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

At the fourth social meeting, held January 13th, Dr. E. T. Bruen, of the University of Pennsylvania, delivered a lecture on "the germ theory of disease," giving a historical sketch of the various views held in regard to the contagiousness of certain diseases, more particularly since the discovery of spermatozoa, in 1679, in regard to malaria, fermentation, the physico-chemical theory, and, finally, the germ theory of the present day. He divided the infectious diseases into three classes, according to the manner in which they are communicated; explained the causes of immunity against various diseases, and pointed out the manner in which the growth and reproduction of the germs may be inhibited. The best agent for this purpose is mercuric chloride in very dilute solution, this being far more effectual than other chemicals; but the different germs do not behave alike, and there are only very few reliable germicides, the surest being destruction of the infected material by fire.

Mr. Sayre afterwards read a paper on "cocaine," giving a history of the coca plant, its cultivation and uses, and its chemical history, with the therapeutical uses of the alkaloid.

After various recitations the meeting adjourned.

EDITORIAL DEPARTMENT.

PRELIMINARY EDUCATION OF PHARMACISTS.—The deficient education of many young men entering upon the pursuit of pharmacy in the United States, has been frequently commented upon, and proprietors of drug stores have been repeatedly urged to pay more attention to the educational acquirements of those whom they take as apprentices; yet a practical plan of securing greater uniformity in their previous education has not been presented. The committee entrusted by the American Pharmaceutical Association with preparing the draft of a pharmacy law sixteen years ago, had this subject under consideration, and after a lengthy discussion could not discover a direct way, promising success, for accomplishing that which in Europe is reached by the enactment of laws or government regulations. A compromise was finally reached and agreed to by Professor Edward Parrish, who, however, had no hope that the point aimed at would be gained. This draft of a pharmacy law was reported to the Chicago meeting in 1869 and recommended by the Association; it recognized the existing state of things and provided for the future that pharmacists before commencing business, should become Graduates in Pharmacy, the avowed aim being that the Colleges of Pharmacy should be made responsible for the education of all pharmacists, and thus in an indirect manner secure the general education of the young men before they became *apprentices*.

Rhode Island is the *only* State where this law was enacted, in March, 1870, only to be repealed and modified in the year following. No other pharmacy law has had a provision with a similar object, either directly or indirectly. This failure, which came not unexpected to Professor Parrish,

induced him to write that paper, referred to elsewhere (see pages 67 and 73), on "The Preliminary Education of Apprentices," and while writing it he had also the counsel of Professor Procter, who agreed with the views expressed therein.

The laws regulating the practice of medicine, which have been enacted in a number of States, take precisely the position which was recommended to the pharmacists in 1869, and the Medical Colleges are now responsible not only for the knowledge in medicine and surgery, but also for the general culture of their graduates. If the Medical Colleges in the United States would cease to exist, no one could become a physician in the States referred to, except by studying and graduating in a foreign country. But if all the Colleges of Pharmacy in the United States were wiped out of existence, the number of pharmaceutical aspirants would not be less—perhaps greater—than at present, because *no* pharmacy law makes attendance and graduation at a College a prerequisite for carrying on the drug business. The difference between practitioners of pharmacy and of medicine will still be greater if the efforts now being made in several States should be successful requiring of the latter to be graduates in medicine *and* to pass a professional examination before a board of physicians not connected with a medical school.

It is our conviction that there is a decided improvement in the personnel of the pharmacists throughout the country; but it is not denied that there is room for more improvement; this, however, should come in at the *beginning* of the pharmaceutical career, if the claims of pharmacy as a profession are to be made good and maintained. In whatever manner the desirable liberal preliminary education may be secured, it certainly cannot be done by excluding those in quest of further instruction from the present or other educational institutions, since they cannot, on these grounds, be prevented from carrying on the apothecaries' business.

OBITUARY.

DR. HERMANN KOLBE, Professor of Chemistry at the University of Leipzig, died suddenly, November 25th, in the 67th year of his life. He studied chemistry under Woehler and Bunsen, and was for a time assistant to Playfair, in London, and occupied for 14 years the chair of chemistry at the University of Marburg. His investigations are very numerous; the synthetical preparation of salicylic acid from phenol has made his name widely known, also among those not directly interested in chemistry. He was the author of several works on chemistry, and of numerous essays which were mostly published in the "*Journal für praktische Chemie*," edited by him. He was a sharp critic and fearless in expressing his convictions of what he conceived to be wrong.

DR. BENJAMIN SILLIMAN, Professor of Chemistry at Yale College, died January 14th, aged 69 years. For seven years he occupied the chair of chemistry and toxicology at the University of Louisville, and afterwards succeeded his father at Yale, where he taught his favorite science for thirty years until his death. His numerous contributions to science were mostly published in the "*American Journal of Science and Arts*."